

**Claims**

## 1. A pressure relief valve comprising:

a housing having a passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage, the housing including a discharge opening for relieving pressurized fluid from the housing during operation of the relief valve;

a valve member positioned within the housing, the valve member being movable along an axis within the housing to selectively engage the seal surface in a sealing relationship, the housing being sized and shaped to substantially restrict movement of the valve member to a direction parallel to the axis; and

a spring coupled to the valve member and a portion of the housing, the spring applying a spring force to the valve member to bias the valve member into contact with the seal surface, wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the spring force thereby allowing pressurized fluid to pass through the discharge opening in the housing.

2. The relief valve of claim 1, wherein the valve member has one or more through-holes formed therein.

3. The relief valve of claim 2, wherein the one or more through-holes are arranged on the valve member to inhibit fluid flow through the through-holes when the valve member is sealing engaged with the seal surface.

4. The relief valve of claim 3, wherein the seal surface is generally annular in shape.

5. The relief valve of claim 4, wherein the valve member is disk-shaped having a generally circular bottom surface for engaging the seal surface.

6. The relief valve of claim 5, wherein the holes are arranged in a circular pattern about the circumference of the bottom surface.

7. The relief valve of claim 2, wherein the through-holes are uniformly spaced about the valve member.
8. The relief valve of claim 7, wherein the through-holes are commonly sized and shaped.
9. The relief valve of claim 1, wherein the seal surface has an annular groove formed therein for receiving an elastomeric seal ring.
10. The relief valve of claim 1, wherein the valve member includes a spring recess sized to receive at least an end of the spring.
11. The relief valve of claim 10, wherein the spring recess is centered on the axis of motion of the valve member.
12. The relief valve of claim 1, wherein the housing includes a second spring recess sized to receive another end of the spring, the second spring recess being aligned with the spring recess in the valve member.
13. A pressure relief valve comprising:
  - a housing having a passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage, the housing including a discharge opening for relieving pressurized fluid from the housing during operation of the relief valve;
  - a valve member positioned within the housing, the valve member being movable in a reciprocating manner along an axis within the housing to selectively engage the seal surface of the base in a sealing relationship, the valve member having one or more through-holes formed therein; and
  - a spring coupled to the valve member and applying a spring force to the valve member to bias the valve member into contact with the seal surface, wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the spring force thereby allowing pressurized fluid to pass through the through-holes in the valve member and out of the valve through the discharge opening in the cover.

14. The relief valve of claim 13, wherein the seal surface is generally annular in shape.
15. The relief valve of claim 14, wherein the valve member is disk-shaped having a generally circular bottom surface for engaging the seal surface.
16. The relief valve of claim 15, wherein the holes are arranged in a circular pattern about the circumference of the bottom surface.
17. The relief valve of claim 14, wherein the diameter of the circular pattern is greater than the width of the opening in the passage.
18. The relief valve of claim 13, wherein the one or more through-holes are arranged on the valve member to inhibit fluid flow through the through-holes when the valve member is sealingly engaged with the seal surface of the base.
19. The relief valve of claim 18, wherein the through-holes are uniformly spaced in a pattern about the valve member.
20. The relief valve of claim 19, wherein the through-holes are commonly sized and shaped.
21. The relief valve of claim 20, wherein the pattern of through-holes is circular in shape, and a diameter of the pattern is greater than the width of the opening in the passage
22. A pressure relief valve comprising:
  - a base having passage formed therein for connection with a fluid source and a seal surface positioned about an opening in the passage;
  - a housing cover having a cylindrical cavity formed therein, the cover engaging the base in a sealing relation ship and enclosing the seal surface within the cavity, the cavity including a discharge opening for relieving pressurized fluid from the cavity during operation of the relief valve;

a disk-shaped valve member positioned within the cavity, the valve member being movable in a reciprocating manner along a center-line axis of the cavity such that a bottom surface of the valve member selectively engages the seal surface of the base in a sealing relationship, the cavity having a diameter approximate to the diameter of the valve member to substantially restrict movement of the valve member to a direction parallel to the center-line axis, the valve member having plurality of through-holes formed therein, the holes being arranged in a circular pattern about the circumference of the bottom surface of the valve member, the circular pattern having a diameter greater than a width of the opening to inhibit fluid flow through the through-holes when the bottom surface of the valve member is sealingly engaged with the seal surface of the base; and

a spring coupled to the valve member and to the cover, the spring applying a spring force to the valve member to bias the valve member into contact with the seal surface, wherein the valve member separates from the seal surface upon application of a fluid pressure force on the valve member that is greater than the spring force thereby allowing pressurized fluid to pass through the through-holes in the valve member and out of the valve through the discharge opening in the cover.